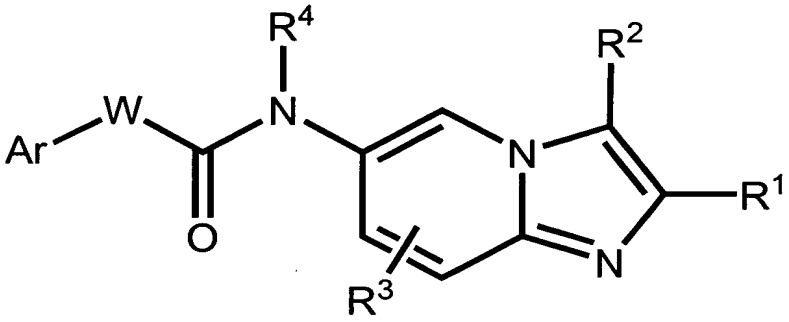
CLAIMS

Imidazopyridine derivatives represented by a general formula [I]



[I]

[in which

R^1 and R^2 stand for same or different substituents selected from the group consisting of

1)hydrogen

2) halogen

3) $C_{1\text{-}6}$ alkyl

4) $C_{3\text{-}8}$ cycloalkyl-$C_{0\text{-}4}$ alkyl

5) $C_{1\text{-}6}$ alkylamino

6) di-$C_{1\text{-}6}$ alkylamino

7) $C_{1\text{-}6}$ alkylcarbonylamino

8) $C_{1\text{-}6}$ alkylcarbonyl-($C_{1\text{-}6}$ alkyl)amino,

and

9) 3 to 8-membered heterocycloalkyl-$C_{0\text{-}4}$ alkyl,

wherein $C_{1\text{-}6}$ alkyl moiety may be substituted with R^5, cycloalkyl or heterocycloalkyl moiety may be substituted with R^6, and R^1 and R^2 are not hydrogen at the same time, or

R^1 and R^2 together form -(CH_2)m-, m standing for an integer of 3 – 6, wherein 1 or 2 hydrogen atoms constituting methylene may be substituted with R^6,

R^3 stands for hydrogen, halogen, $C_{1\text{-}6}$ alkyl or $C_{1\text{-}6}$ alkyloxy,

R^4 stands for hydrogen or $C_{1\text{-}6}$ alkyl,

R^5 stands for a substituent selected from the group consisting of halogen, cyano, hydroxyl, amino, optionally fluorine- or

hydroxyl-substituted C_{1-6} alkyl, mono-C_{1-6} alkylamino, di-C_{1-6} alkylamino, optionally fluorine-substituted C_{1-6} alkyloxy, C_{1-6} alkyloxy-C_{1-6} alkyl, C_{1-6} alkyloxycarbonyl, C_{1-6} alkyloxy-carbonylamino, C_{1-6} alkyloxycarbonyl-(C_{1-6} alkyl)amino, C_{1-6} alkylcarbonyl, C_{1-6} alkylcarbonyloxy, C_{1-6} alkylcarbonylamino, C_{1-6} alkylcarbonyl-(C_{1-6} alkyl)amino, carbamoyl, mono-C_{1-6} alkylcarbamoyl, di-C_{1-6} alkylcarbamoyl, carbamoylamino, mono-C_{1-6} alkylcarbamoylamino, di-C_{1-6} alkylcarbamoylamino, mono-C_{1-6} alkylcarbamoyl-(C_{1-6} alkyl)amino, di-C_{1-6} alkylcarbamoyl-(C_{1-6} alkyl)amino, carbamoyloxy, mono-C_{1-6} alkylcarbamoyloxy, di-C_{1-6} alkylcarbamoyloxy, C_{1-6} alkylsulfonyl, C_{1-6} alkylsulfonylamino, C_{1-6} alkylsulfonyl-(C_{1-6} alkyl)amino, sulfamoyl, mono-C_{1-6} alkylsulfamoyl, di-C_{1-6} alkylsulfamoyl, sulfamoylamino, mono-C_{1-6} alkylsulfamoylamino, di-C_{1-6} alkylsulfamoylamino, mono-C_{1-6} alkylsulfamoyl-(C_{1-6} alkyl)amino, di-C_{1-6} alkylsulfamoyl-(C_{1-6} alkyl)amino and pyridone,

R^6 stands for R^5 or oxo,

W stands for

1) linker (single bond)

2) mono- or bi-cyclic, 3 to 8-membered aromatic or aliphatic heterocyclic group,

3) mono- or bi-cyclic, 3 to 8 membered aromatic or aliphatic carbocyclic group,

4) C_{2-4} alkylene in which the carbon in the main chain may be substituted with oxygen, or

5) C_{2-4} alkenylene in which the carbon in the main chain may be substituted with oxygen,

those substituents in above 2) through 5) being optionally substituted with R^5,

Ar stands for optionally R^7-substituted aromatic carbocyclic group or aromatic heterocyclic group, said aromatic carbocyclic group or aromatic heterocyclic group standing for a substituent selected from the group consisting of

1) phenyl,

2) naphthyl,

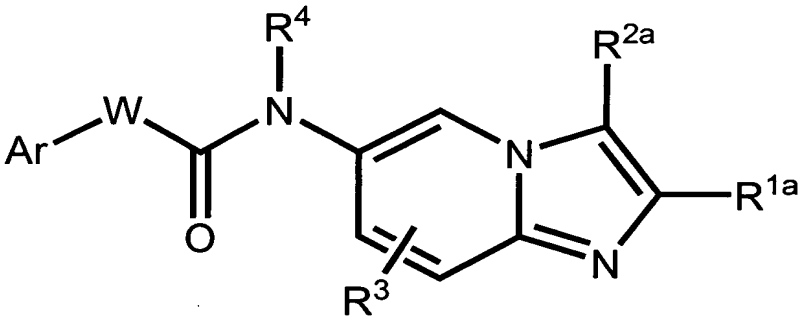
3) pyridinyl,
4) pyrimidinyl,
5) pyridazinyl,
6) pyrazyl,
7) pyrazole,
8) pyrrolyl,
9) imidazolyl,
10) triazolyl,
11) oxazolyl,
12) isoxazolyl,
13) oxadiazolyl,
14) thiazolyl,
15) isothiazolyl,
16) thiadiazolyl, and
17) tetrazolyl

and

R^7 is same as R^5]

or their pharmaceutically acceptable salts.

2. Imidazopyridine derivatives represented by a general formula [I-1]



[I-1]

[in which

R^{1a} and R^{2a} stand for same or different substituents selected from the group consisting of

1) hydrogen
2) halogen
3) C_{1-6} alkyl

4) C_{3-8} cycloalkyl-C_{0-4} alkyl

5) C_{1-6} alkylamino

6) di-C_{1-6} alkylamino

7) C_{1-6} alkylcarbonylamino

8) C_{1-6} alkylcarbonyl-(C_{1-6} alkyl)amino,

and

9) 3 to 8-membered heterocycloalkyl,

wherein C_{1-6} alkyl moiety may be substituted with R^{5a}, cycloalkyl or heterocycloalkyl moiety may be substituted with R^6, and R^{1a} and R^{2a} are not hydrogen at the same time, or

R^{1a} and R^{2a} together form -$(CH_2)m$-, m standing for an integer of 3 – 6, wherein 1 or 2 hydrogen atoms constituting methylene may be substituted with R^6,

R^{5a} stands for a substituent selected from the group consisting of halogen, cyano, hydroxyl, optionally fluorine- or hydroxyl-substituted C_{1-6} alkyl, optionally fluorine-substituted C_{1-6} alkyloxy, C_{1-6} alkyloxy-C_{1-6} alkyl, C_{1-6} alkyloxycarbonyl, C_{1-6} alkyloxy-carbonylamino, C_{1-6} alkyloxycarbonyl-(C_{1-6} alkyl)amino, C_{1-6} alkylcarbonyl, C_{1-6} alkylcarbonyloxy, C_{1-6} alkylcarbonylamino, C_{1-6} alkylcarbonyl-(C_{1-6} alkyl)amino, carbamoyl, mono-C_{1-6} alkylcarbamoyl, di-C_{1-6} alkylcarbamoyl, carbamoylamino, mono-C_{1-6} alkylcarbamoylamino, di-C_{1-6} alkylcarbamoylamino, mono-C_{1-6} alkylcarbamoyl-(C_{1-6} alkyl)amino, di-C_{1-6} alkylcarbamoyl-(C_{1-6} alkyl)amino, carbamoyloxy, mono-C_{1-6} alkylcarbamoyloxy, di-C_{1-6} alkylcarbamoyloxy, C_{1-6} alkylsulfonyl, C_{1-6} alkylsulfonylamino, C_{1-6} alkylsulfonyl-(C_{1-6} alkyl)amino, sulfamoyl, mono-C_{1-6} alkylsulfamoyl, di-C_{1-6} alkylsulfamoyl, sulfamoylamino, mono-C_{1-6} alkylsulfamoylamino, di-C_{1-6} alkylsulfamoylamino, mono-C_{1-6} alkylsulfamoyl-(C_{1-6} alkyl)amino, di-C_{1-6} alkylsulfamoyl-(C_{1-6} alkyl)amino and pyridone, and

R^3, R^4, R^6, W and Ar have the same significations to those given in Claim 1]

or their pharmaceutically acceptable salts.

3. The compounds or their pharmaceutically acceptable salts

according to Claim 1, in which R^1 is C_{1-6} alkyl, C_{1-6} cycloalkyl, C_{1-6} alkylamino, di-C_{1-6} alkylamino or C_{1-6} alkylcarbonyl-(C_{1-6} alkyl)amino.

4. The compounds or their pharmaceutically acceptable salts according to Claim 1, in which R^2 is hydrogen, C_{1-6} alkyl, C_{1-6} cycloalkyl, C_{1-6} alkylamino, di-C_{1-6} alkylamino or C_{1-6} alkylcarbonyl-(C_{1-6} alkyl)amino.

5. The compounds or their pharmaceutically acceptable salts according to Claim 2, in which R^{1a} is C_{1-6} alkyl, C_{1-6} cycloalkyl, C_{1-6} alkylamino, di-C_{1-6} alkylamino or C_{1-6} alkylcarbonyl-(C_{1-6} alkyl)-amino.

6. The compounds or their pharmaceutically acceptable salts according to Claim 2, in which R^{2a} is hydrogen, C_{1-6} alkyl, C_{1-6} cycloalkyl, C_{1-6} alkylamino, di- C_{1-6} alkylcarbonyl-(C_{1-6} alkyl)amino.

7. The compounds or their pharmaceutically acceptable salts according to Claim 1 or 2, in which the 3 to 8-membered heterocycloalkyl moiety is selected from the group consisting of tetrahydrofuranyl, tetrahydropyranyl, pyrrolidinyl and piperidinyl.

8. The compounds or their pharmaceutically acceptable salts according to any one of Claims 1 – 7, in which R^3 is hydrogen, methyl or methoxy.

9. The compounds or their pharmaceutically acceptable salts according to any one of Claims 1 – 8, in which R^4 is hydrogen or methyl.

10. The compounds or their pharmaceutically acceptable salts according to any one of Claims 1 – 9, in which W is selected from the group consisting of 1,2-dimethylene, 1,4-phenylene, 2-fluoro-1,4-phenylene, pyridin-2,5-di-yl, pyrimidin-2,5-di-yl, pyrazin-2,5-di-yl, 1,4-piperidin-di-yl, 1,2,4-triazol-1,3-di-yl, 1,4-cyclohexylene and

oxymethylene.

11. The compounds or their pharmaceutically acceptable salts according to any one of Claims 1 – 10, in which Ar is selected from the group consisting of pyrrol-1-yl, phenyl, 2-fluorophenyl, 3-fluorophenyl, 4-fluoropheny, 4-chlorophenyl, 3,4-difluorophenyl, 2,4-difluorophenyl, 2-trifluoromethylphenyl, 3-trifluoromethylphenyl, 4-trifluoromethylphenyl, 4-methoxyphenyl, 4-methanesulfonylphenyl, pyridin-2-yl, 3-methylpyridin-6-yl, 2-fluoropyridin-5-yl, 3-fluoropyridin- 6-yl, 3-chloropyridin-6-yl, 2-difluoromethylpyridin-5-yl, 3-difluoromethylpyridin-6-yl, 2-methoxypyridin-5-yl, 2-methoxypyridin- 6-yl, 3-methoxypyridin-6-yl, 2-difluoromethoxypyridin-5-yl, 3-difluoromethoxypyridin-6-yl, 3-trifluoromethylpyridin-6-yl, 2-trifluoromethylpyridin-5-yl, 2-pyrimidinyl, 2-pyrazinyl and 3-pyridazinyl.

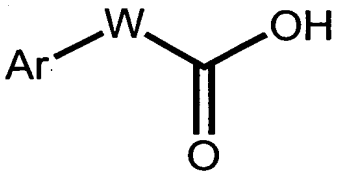
12. The compounds or their pharmaceutically acceptable salts according to Claim 1, in which the compound represented by the general formula [I] is N-(2,3-dimethylimidazo[1,2-a]pyridin-6-yl)-4'-(trifluoromethyl)[1,1'-biphenyl]-4-carboxamide.

13. The compounds or their pharmaceutically acceptable salts according to Claim 1, in which the compound represented by the general formula [I] is N-(2-cyclopropyl-3-methylimidazo[1,2-a]-pyridin-6-yl)-4-(2-pyridyl)benzamide.

14. The compounds or their pharmaceutically acceptable salts according to Claim 1, in which the compound represented by the general formula [I] is N-(2-cyclopropyl-3-methylimidazo[1,2-a]pyridin-6-yl)-4-(1H-pyrro-1-lyl)benzamide.

15. A method for producing a compound represented by the general formula [I] which comprises

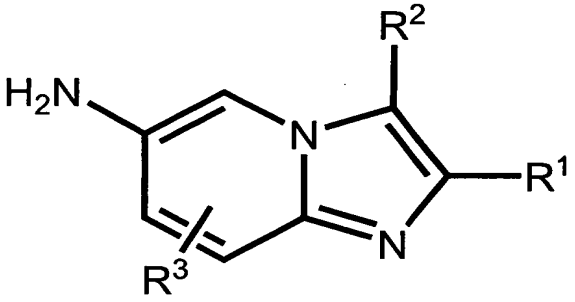
1) a step of amidating a compound represented by a general formula [II]



[II]

[in which Ar and W have the significations as given in Claim 1]

with a compound represented by a general formula [III]



[III]

[in which R^1, R^2 and R^3 have the significations as given in Claim 1]

and

2) a step of condensing, where R^4 is not hydrogen, the compound as obtained in the above step with a compound represented by a general formula [IV]

$$R^4 - X_1 \qquad [IV]$$

[in which X_1 stands for a leaving group and R^4 has the signification as given in Claim 1].

16. Melanin concentrating hormone receptor antagonists which contain the compounds according to Claims 1 – 14 as the active ingredient.

17. Medical compositions containing the compounds

according to Claims 1 – 14 or their pharmaceutically acceptable salts, and pharmaceutically acceptable carriers.

18. Preventing or treating agents containing the compounds according to Claims 1 – 14 as the active ingredient, of diseases such as metabolic disorders represented by obesity, diabetes, hormone disorder, hyperlipidemia, gout, fatty liver, hepatitis and cirrhosis; cardiovascular disorders represented by stenocardia, acute or congestive heart failure, myocardial infarction , coronary atherosclerosis, hypertension, renal diseases and electrolyte abnormality; central nervous system or peripheral nervous system disorders represented by bulimia, emotional disturbance, depression, anxiety, epilepsy, delirium, dementia, schizophrenia, attention-deficit hyperactivity disorder, memory impairment, sleep disorders, cognitive failure, dyskinesia, paresthesias, smell disorders, morphine tolerance, drug dependence and alcoholism; reproductive disorders represented by infertility, preterm labor and sexual dysfunction; digestive disorders; respiratory disorders; cancer or pigmentation.

19. A preventing or treating agent according to Claim 18, which is a preventing or treating agent of obesity.